

WHAT IS CLAIMED IS:

1 1. For use with a valve stem assembly, a snap-in grommet, the
2 grommet comprising:
3 a grommet body comprising;
4 a nose section at a first end of the grommet body, the nose
5 section having a substantially conical shape to provide for insertion of the grommet
6 body into an inflation hole of a vehicle wheel rim;
7 an annular section at a base of the nose section, the annular
8 section projecting radially outward from the base of the nose section;
9 a cylindrical section sized to match the inflation hole and
10 having a first end adjoined to the annular section;
11 a flange section projecting radially outward from a second end
12 of the cylindrical section; and
13 an axial bore passing centrally through the grommet body; and
14 an integral sleeve located within the grommet body bore, the sleeve
15 having an outer surface configured to match the grommet body bore, and having a
16 bore configured to receive a valve stem.

1 2. The grommet of claim 1 wherein the integral sleeve has a
2 length configured to limit compression of the grommet body during installation of
3 a retention nut to the valve stem.

1 3. The grommet of claim 1 wherein the grommet is retained in
2 the inflation hole by compression of the annular section against an outside surface
3 of the wheel rim and compression of the flange section against an inside surface of
4 the wheel rim.

1 4. The grommet of claim 1 wherein at least one interface seal is
2 formed on a surface of the flange section opposite to the cylindrical section, the at
3 least one seal implemented as a hemispherical projection located concentrically about
4 a center axis of the grommet and configured to interface with a substantially flat
5 surface of a flange of the valve stem.

1 5. The grommet of claim 1 wherein the integral sleeve is
2 implemented using one of a high temperature plastic, aluminum, brass or copper.

1 6. The grommet of claim 1 wherein the integral sleeve comprises
2 a separate component inserted into the bore.

1 7. The snap-in grommet of claim 1 wherein the grommet body
2 is over-molded over the sleeve.

1 8. The grommet of claim 1 wherein an outer surface of the
2 integral sleeve comprises at least one of at least one ridge extending in a longitudinal
3 direction relative to the sleeve, cross-hatchings and knurling.

1 9. The grommet of claim 1 wherein the grommet body comprises
2 a synthetic rubber.

1 10. A method of reducing air leakage at a vehicle tire valve stem
2 and grommet assembly, the method comprising:

3 inserting a snap-in grommet into an inflation hole in a vehicle wheel
4 rim, wherein the grommet comprises a grommet body having;

5 a nose section at a first end of the grommet body, the nose
6 section having a substantially conical shape to provide for insertion of the grommet
7 body into an inflation hole of a vehicle wheel rim;

8 an annular section at a base of the nose section, the annular
9 section projecting radially outward from the base of the nose section;

10 a cylindrical section sized to match the inflation hole and
11 having a first end adjoined to the annular section;

12 a flange section projecting radially outward from a second end
13 of the cylindrical section; and

14 an axial bore passing centrally through the grommet body; and

15 an integral sleeve located within the grommet body bore, the
16 sleeve having an outer surface configured to match the grommet body bore and
17 having a bore configured to receive a valve stem; and
18 inserting the valve stem through the sleeve bore of the snap-in
19 grommet from an inside of the vehicle wheel rim to an outside of the vehicle wheel
20 rim; and
21 tightening a retaining nut assembly onto a threaded portion of the
22 valve stem from the outside of the vehicle wheel rim, wherein the tightening
23 compresses a substantially flat surface of the flange section opposite the first end
24 against a substantially flat surface of a flange of the valve stem.

1 11. The method of claim 10 wherein the integral sleeve has a
2 length configured to limit compression of the grommet body during the tightening
3 of the retention nut assembly to the valve stem.

1 12. The method of claim 10 wherein at least one interface seal is
2 formed on a surface of the flange section opposite to the cylindrical section, the at
3 least one seal implemented as a hemispherical projection located concentrically about
4 a center axis of the grommet and configured to interface with a substantially flat
5 surface of a flange of the valve stem.

1 13. The method of claim 10 wherein the snap-in grommet is
2 inserted into the inflation hole of the vehicle wheel rim from the inside of the wheel
3 rim, until the annular section of the grommet passes through the outside of the wheel
4 rim.

1 14. For use with a valve stem assembly, a grommet, the grommet
2 comprising:
3 a grommet body comprising:
4 a nose section at a first end of the grommet body, the nose
5 section having a substantially conical shape to provide for insertion of the grommet
6 body into an inflation hole of a vehicle wheel rim;

7 a cylindrical section having a first end adjoined to the nose
8 section;
9 a flange section that projects radially outward from the surface
10 of the second end of the grommet body;
11 an axial bore passing centrally through the grommet body; and
12 an integral sleeve located within the grommet body bore, the sleeve
13 having an outer surface configured to match the grommet body bore and a bore
14 configured to receive a valve stem.

1 15. The grommet of claim 14 wherein the integral sleeve has a
2 length configured to limit compression of the grommet body during installation of
3 a retention nut to the valve stem.

1 16. The grommet of claim 14 wherein the grommet is retained in
2 the inflation hole by compression of the flange section against an inside surface of
3 the wheel rim.

1 17. The grommet of claim 14 wherein at least one interface seal
2 is formed on a surface of the flange section opposite to the cylindrical section, the
3 at least one seal implemented as a hemispherical projection located concentrically
4 about a center axis of the grommet and configured to interface with a substantially
5 flat surface of a flange of the valve stem.

1 18. The grommet of claim 14 wherein the integral sleeve is
2 implemented using one of a high temperature plastic, aluminum, brass or copper.

1 19. The grommet of claim 14 wherein the integral sleeve
2 comprises a separate component inserted into the bore.

1 20. The snap-in grommet of claim 14 wherein the grommet body
2 is over-molded over the sleeve.